

## REMARKS

Claims 12-21 are pending.

Claim 12 is amended.

### 35 U.S.C. 103(a) Rejections

Claims 12-21 under 35 U.S.C. 103(a) as being unpatentable over EP586,911 and Sylling et al. WO 85/01938.

For clarity, the Applicants state that the invention is: a process comprising adding a composition, which contains polymer and at least 10 wt. % fertilizer. Said composition has extraordinary low viscosity which allows dosing of the concentrated composition to water using dosing equipment in place for concentrated fertilizer solutions. The Applicants have amended claim 1 to more particularly point out the invention and reflect the process advantages of adding a composition according to the invention. Claim 1 has been amended by adding, wherein the aqueous soil treatment composition is suitable for being processed in dosing equipment which is in place for processing solutions of fertilizer alone and the diluted composition stabilizes and fertilizes the soil. No new matter has been added.

Neither Sylling nor EP '911 recognizes the low viscosity advantages of the inventive process for adding compositions comprising high anionic content (60 to 80%) with high fertilizer content (at least 10%) as will be explained below.

The present invention exemplifies polymer B on page 5, first two lines (65 w% anionic monomer, 35 w% nonionic monomer, a ratio of monomers which are encompassed by claim 1). Compositions containing 2 w% of this polymer and various fertilizers, namely urea ammonium nitrate (table 1, line 3), ammonium sulfate (table 1, line 6) and potassium chloride (table 2, lines 4 and 5), show extremely low viscosities, namely 1510 cPs, 640 cPs, 350 and 375 cPs. The advantage of these compositions is their low viscosity that allows the fertilizer and the polymer to be added together at only one point to the irrigation water using dosing equipment currently in place for irrigation systems. In addition the compositions containing polymer B and various fertilizers still show excellent soil stabilizing characteristics as can be seen by the flocculation values, which are 28.5% (table 1, line 3), 37.6% (table 1 line 6), 37.2% (table 2, line 4) and 22.9% (table 2, line 5) based on the flocculation value of the control (no polymer).

Compositions containing 2 w% of a polymer having an anionic monomer content outside the range of 60 to 80 w% and various fertilizers all, despite two exceptions, show viscosities above 3500 cPs (tables 1 and 2). The exceptions are the compositions containing polymer E (table 1, line 8) and polymer H (table 2, line 6), which show viscosities of 90 and 1250 cPs, respectively. The composition containing polymer E, however, does not show any soil stabilizing effect.

The fact that only soil treatment compositions containing at least 10 w% fertilizer and a polymer having an anionic monomer content of 60 to 80 w% and a nonionic monomer content of 20 to 40 w% show exceptional low viscosities is an unexpected result, which could not be predicted by a skilled person.

EP '911, in contrast does not show even one example of Applicants' claimed ratio of anionic to nonionic copolymers in combinations with soil nutrients. See examples 1-7 in EP '911 which show copolymer compositions of 10% anionic and 90% nonionic or 100% anionic. Furthermore, EP '911 makes no mention of viscosity advantages of the particular inventive ratio of anionic to nonionic. Clearly EP '911 did not recognize the low viscosity advantages of particular anionic to non-ionic monomer ratios in combination with fertilizer.

Styling et al WO 85/01938 describes a soil treatment composition which is an aqueous solution comprising organophosphorus acids and an anionic water-soluble low molecular weight polymer (page 5, lines 3 to 7). This composition is used for **desalination of soil and definitely not suitable for fertilization and soil stabilization**. The amended claim 1 now encompasses only fertilization and stabilization soil treatment.

Furthermore, Styling et al. WO '938 uses low molecular weight anionic dispersants to drive high sodium and alkaline ions away from growth sites. The anionic of Sylling are not used to stabilize the soil as in EP '911 or in the present invention. In fact, the anionic of Sylling are "not intended as a means of introducing fertilizers to crops." See page 6 lines 18-21. WO85/01938 teaches to take off salts from the soil. The instant invention is directed to a process, which adds fertilizer to the soil. Thus, it relates to a different technical area and does not constitute relevant prior art.

In addition, the claimed process differs from that disclosed in WO 85/01938 in that the present invention contains a water-soluble polymer of high molecular weight formed from 60 to 80 w% anionic monomer. Styling makes absolutely no mention of the percent anionic composition of the low

molecular weight polymer. WO 85/01938 also does not render obvious the claimed process when combined with EP '911, because WO 85/01938 does not disclose aqueous solutions comprising a water-soluble polymer having an intrinsic viscosity from 9 to 12 dl/g and an anionic monomer content from 60 to 80 w%.

Furthermore, the combination of EP '911 and Sylling would not arrive at the present invention. Neither EP'911 or Sylling exemplify the particular anionic to nonionic ratios embodied in the instant invention. Neither suggests the exemplified viscosity advantages shown and claimed by the instant invention. There is no particular reason why a person skilled in the art would combine EP '911 and Sylling since EP '911 is directed to a chemical grouting which prevents erosion and Sylling is directed to a chemical composition used to desalinate soil, not useful for delivering soil nutrients.

In summary the 103(a) rejection is improper because:

1. There is no suggestion within EP '911 and Sylling to combine to achieve the instant invention. EP'911 is directed to a chemical grouting which prevents erosion and Sylling is directed to a chemical composition used to desalinate soil, not useful for delivering soil nutrients. It makes no sense to combine these references as the chemical compositions in each have completely different soil functions. One drives salts away from a soil site (Sylling). The other grouts a soil nutrient composition to the soil site (EP '911). Even if they were combined, a person skilled in the art would not arrive at the inventive low viscosity anionic copolymer (60 to 80% anionic) composition of the instant invention.
2. Neither reference teaches the inventive low viscosity anionic copolymer composition of the instant invention. Neither reference recognizes the unobvious exemplified viscosity advantages of the particular anionic composition of the present invention (Table I of instant specification) in combination with the fertilizer and the advantages of such a composition when used in dosing equipment which is in place for processing solutions of fertilizer.

Thus the 103(a) rejections of EP '911 and/or Sylling are overcome.

Claims 12-21 stand rejected under 35 USC 103(a) as being unpatentable over JP51-124578.

JP 51-124578 discloses a soil treatment composition which is an aqueous solution comprising fertilizer and a water-soluble polymer consisting of 50 to 70 w% acrylamide and 30 to 50 w%

potassium acrylate (page 2, third paragraph). This composition imparts to soil water-resistant aggregation ability and water-permeability as well as water retention property and is further useful as a fertilizer (page 1, third paragraph). In example c) the concentrated soil treatment composition of example a) is diluted to a fertilizer concentration of 2 wt. % before being applied to sand soil.

The claimed composition differs from the composition disclosed in JP 51-124578 in that it contains a water-soluble polymer formed from 60 to 80 wt.% anionic monomer and 20 to 40 w% nonionic monomer. JP '578 specifically points to preferred range of acrylamide content in the range of from 70 to 50% by mole (page 2, paragraph 3 of translation). This leads to anionic compositions containing 30 to 50% preferred in JP '578. The advantage of the instant anionic non-ionic ratios and the resulting polymer in combination with at least 10 wt. % fertilizer is discussed above. The composition disclosed in JP 51-124578 can be diluted by water and then applied to the soil. However, it is not disclosed if this composition can also be added easily to irrigation water and thus is suitable for being processed using the dosing equipment which is in place for processing solutions of fertilizer alone. As the instant disclosure shows low anionic content polymers tend to form viscous aqueous solutions unless used at low concentrations, the compositions of JP 51-124578 should be much higher than that of the claimed composition.

Accordingly, the view by the Examiner of the range of anionic to non-ionic polymer used in the aqueous soil treatment as obvious over the prior art is improper. The Examiner is disregarding the statutory requirement that the invention be viewed as a whole and ignoring the contribution the present invention makes to the prior art, namely reduced viscosity by increasing the anionic content of the polymer. Table I clearly shows this advantage, an advantage not suggested or mentioned in JP '578.

To summarize:

1. The present invention claims a specific ratio of anionic to non-ionic monomer blend, a ratio not recognized for its viscosity advantages within JP '578. The low viscosities of polymers containing high levels of anionic monomer allow the formulation of the anionic polymer with fertilizer solutions using dosing equipment currently available.
2. The present invention additionally discloses unobvious results using the high anionic content in Table I of the specification.


Therefore, the 103(a) rejection is improper and Applicants ask that the Examiner reconsider.

Reconsideration and withdrawal of the rejection of claims 12-21 is respectfully solicited in light of the remarks and amendment *supra*.

Since there are no other grounds of objection or rejection, passage of this application to issue with claims is earnestly solicited.

Applicants submit that the present application is in condition for allowance. In the event that minor amendments will further prosecution, Applicants request that the examiner contact the undersigned representative.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Tyler Stevenson', with a long horizontal flourish extending to the right.

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